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# FAUNA OF PENIKESE ISLAND, 1923.

(Edited by R. E. Coker.)

Reprinted from Biological Bulletin, Vol. L, No. 1, January, 1926.

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## Introduction.

On the occasion of the fiftieth anniversary of the founding of the Agassiz laboratory on Penikese, a biological reconnaissance of the island was undertaken jointly by botanists and zoölogists from the Marine Biological Laboratory and the Fisheries Biological Station of the United States Bureau of Fisheries at Woods Hole, Mass. The studies of the flora have been published under the editorship of Professor I. F. Lewis in *Rhodora*, Vol. 26, Nos. 310, 311 and 312, 1924. The zoölogical collections and studies were made by the workers to be named hereafter, while the arrangement of the report for publication has been entrusted to the present editor.

With regard to the fauna, as well as to the flora, the collections were made by large parties, but chiefly on one day in each case. Practical considerations made it necessary for the zoölogists to restrict attention to the larger animals existing above the tide line, that is to say, to the non-microscopic animals living on the land or in the small freshwater and brackish ponds that are described by Miss Shaw in the report on Flora. Notwithstanding the number of collectors and the varied interests and experiences represented by them, the time spent on Penikese imposed an obvious limit to the exhaustiveness of the collections, especially since the fauna of the island is comprised largely in the group of Arthropods, so many of which are seasonal in appearance.

In the following list are the names of the persons comprising the zoölogical collecting expedition to Penikese Island, August 7, 1923, with the names of the respective institutions with which they were permanently engaged. The abbreviation "M.B.L." for Marine Biological Laboratory or "U.S.F.L." for United States Fisheries Laboratory, is used to denote the local laboratory to which each was temporarily attached during the summer of 1923.

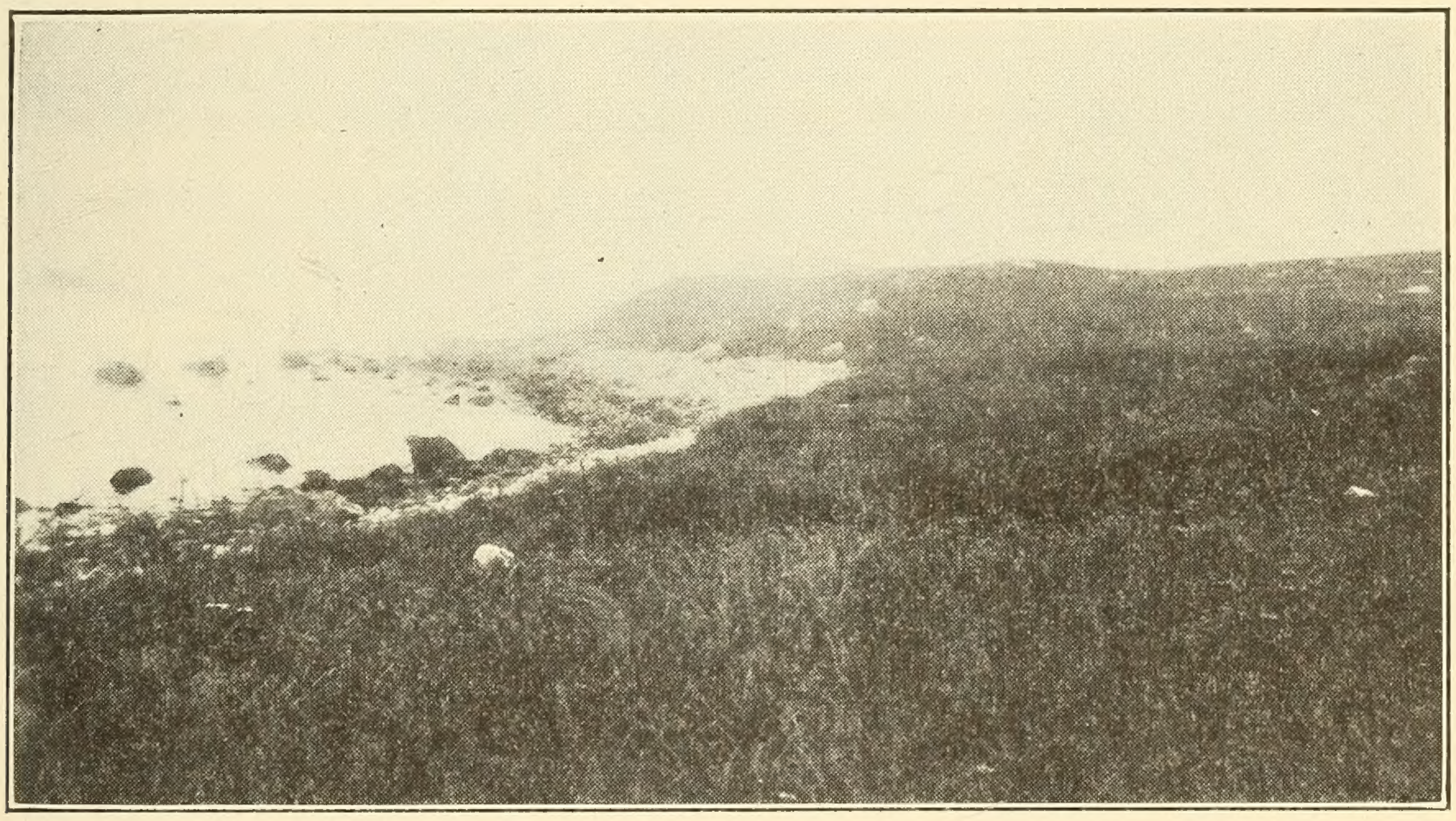
F. E. Chidester, West Virginia University. U.S.F.L.
R. E. Coker, University of North Carolina. U.S.F.L.
Arch E. Cole, Northwestern University. M.B.L.
Manton Copeland, Bowdoin College. M.B.L.
J. A. Dawson, Dalhousie University. M.B.L.
S. R. Detwiler, Harvard University. M.B.L.
Samuel W. Geiser, Washington University. M.B.L.
Robert A. Goffin, U. S. Bureau of Fisheries.
Benjamin Grave, Wabash College. M.B.L.
Caswell Grave, Washington University. M.B.L.
George M. Gray, Marine Biological Laboratory.
Walter N. Hess, De Parmo University. M.B.L.
Hoyt S. Hopkins, Baylor Medical College. M.B.L.
Ondess L. Inman, Antioch College. M.B.L.
Ivey F. Lewis, University of Virginia. M.B.L.
Edwin Linton, Washington and Jefferson College and University of Georgia Medical Dept. U.S.F.L.
S. O. Mast, Johns Hopkins University. M.B.L.
C. E. McClung, University of Pennsylvania. M.B.L.
Everett C. Myers, Johns Hopkins University. M.B.L.
James T. Penney, University of North Carolina. U.S.F.L.
Albert M. Reese, West Virginia University. U.S.F.L.
A. H. Sturtevant, Carnegie Institute of Washington. M.B.L.
Henry C. Tracy, University of Kansas. U.S.F.L.
Arthur D. Whedon, North Dakota Agricultural College. M.B.L.
H. L. Wieman, University of Cincinnati. M.B.L.
Charles B. Wilson, Massachusetts State Normal School, Westfield. U.S.F.L.
John E. Wilson, Student Harvard Law School. U.S.F.L.
F. E. Wood, Illinois Wesleyan University. M.B.L.
Lorande Loss Woodruff, Yale University. M.B.L.
Donnell B. Young, Carleton College. M.B.L.

The following junior members of the expedition rendered helpful service in collecting:

Robert E. Coker, Jr.
Frederick C. Copeland.
Preston S. Copeland.

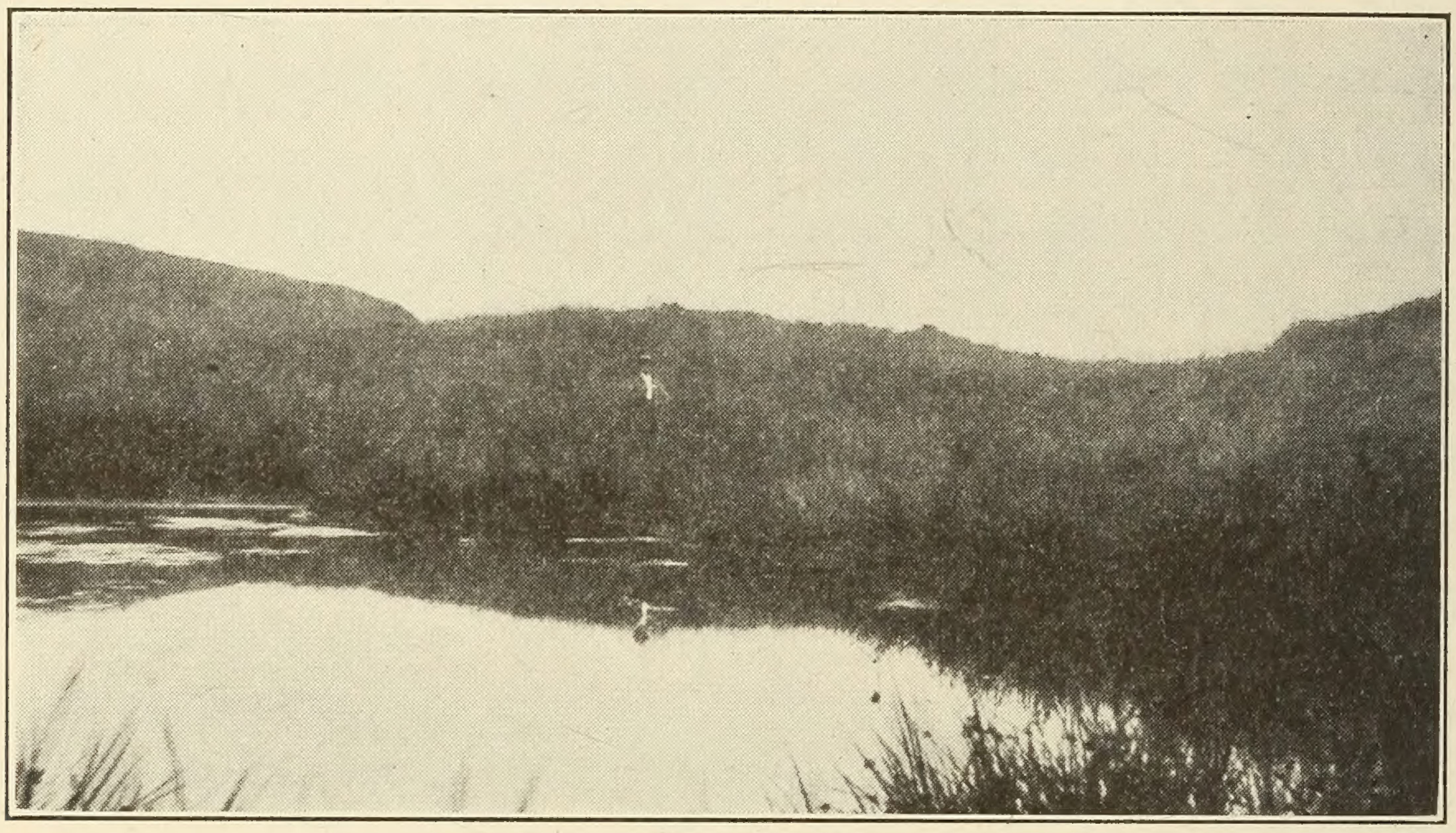
The party was conveyed from the Fisheries Laboratory at Woods Hole to Penikese Island by the U. S. Fisheries Steamer *Pharalope*. Collecting apparatus of every character as available was taken; there were seines, townets, dipnets, butterfly nets, sweeping nets, spade, rakes, gun, dipper, spoon, rat traps, mouse traps, etc., with necessary reagent for killing and preserving, and containers of various sorts, besides maps, labels, salinometers and cameras. The methods employed may be inferred from the apparatus taken.

It was originally contemplated to report the collections by station and habitat, but the character of the fauna of the island to which reference is made on page 25 below, made it evident that no particularly useful purpose would be served by adhering to a plan that would have both complicated the study and greatly extended the report.



Penikese Island. Northwest part, looking north from Pond 2-B. (See footnote to p. 27.)

The study and identification of material was done in part by certain members of the collecting party, and in part by specialists associated with the United States National Museum and the Boston Society of Natural History; cordial acknowledgments are due to those institutions for the assistance that was so freely rendered. Appropriate credit to individuals is given in connection with the lists of species beginning on page 26, but in this place particular mention should be made of the following persons as the virtual authors of the systematic portion of this report: Messrs. C. W. Johnson (insects of several orders), A. H. Sturtevant (Diptera), C. B. Wilson (Odonata, aquatic Hemiptera, and aquatic Coleoptera), C. E. McClung (Orthoptera), Manton Copeland (Lepidoptera—butterflies), J. H. Emerton (Arachnida), Ondess L. Inman and Everett C. Myers (Birds).

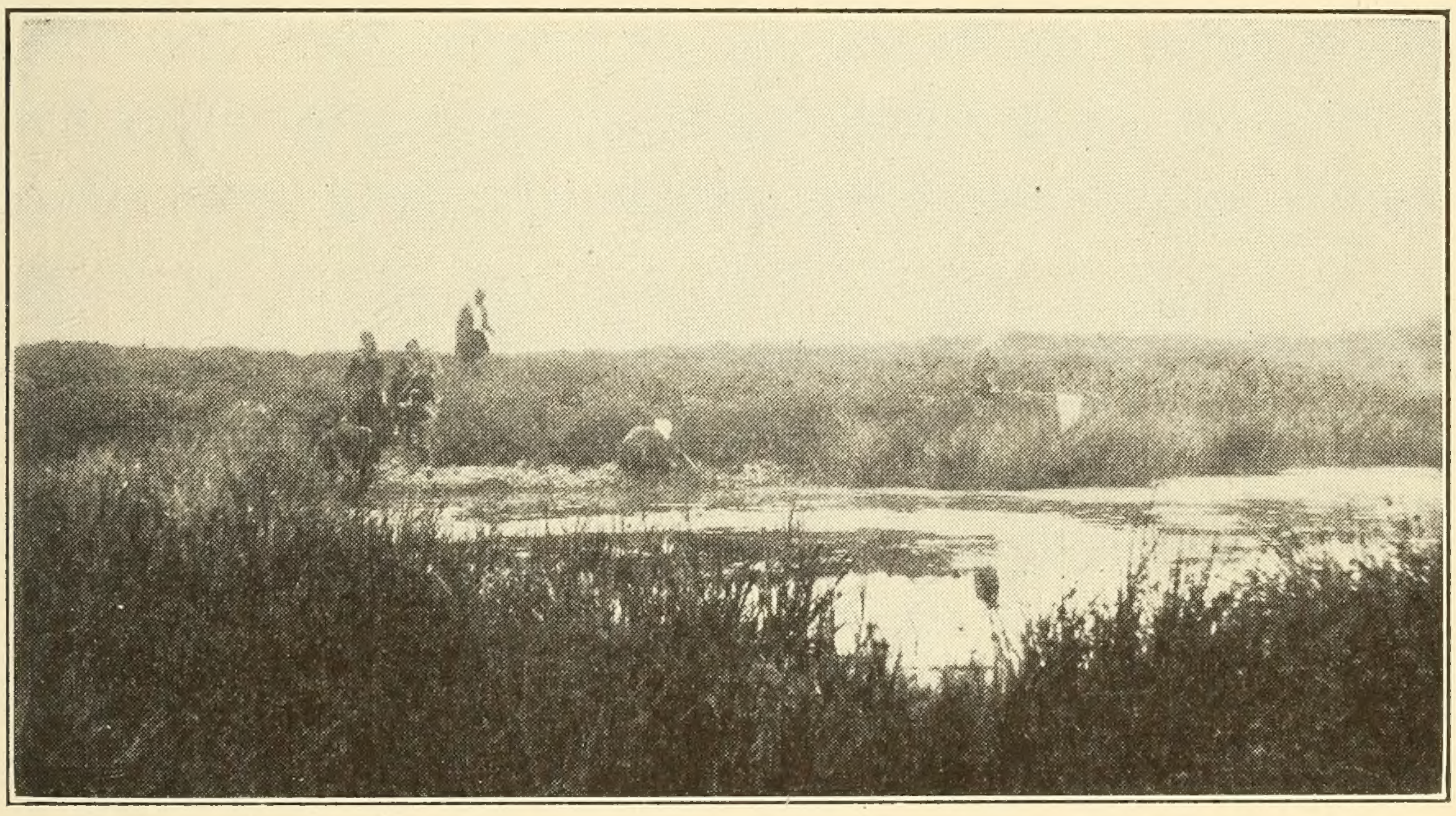


Pond 1-*D*. (See footnote to p. 27.)

The general character of the island and its ecological features as regards the vegetation have been described by Lewis and Miss Shaw in the report previously mentioned. While the vegetational environments are of interest in connection with the consideration of the fauna, it would be superfluous to restate here the data to be found in that publication, especially in the section on "Ecology of Penikese" by Miss Margaret F. Shaw. It is necessary to give only a single quotation from Lewis (below) and to say that the small rocky island is practically devoid of trees, and, except where denuded of all vegetation in some of the nesting grounds of terns, is given over to grasses and other small plants, with rarely a low growing shrub or willow.

"The island Penikese is a remnant of the terminal moraine now seen in the Elizabeth Islands. It is about two thirds of a mile long and half as broad, with a broadly spatulate point for convenience of reference called Tub Point, extending further to the east for another third of a mile. Its contour is dominated by low hills on the main body of the island, with depressions here and there which may be ponds of a rather temporary character (map).

"The original vegetation, like that of neighboring islands, is said by Jordan to have been of a forest type, with pitch pine red cedar, red maple, shagbark, shadbush, poplar birch, hornbeam, and two or three species of sumac. In 1873 there was 'no trace left save the rotten roots of a solitary beech stump and a few branches of red cedar and red maple (?) found buried in the muck of a small swamp.' Cutting of the original timber had been followed by the introduction of sheep, which remained on the island until about 1910. From 1905 to 1921 Penikese was used by the State of Massachusetts as the site of a leprosarium. After the removal of the lepers in 1921 the island has been uninhabited except for the caretaker and his wife.



Pond 2-*D*. (See footnote to p. 27.)

"Jordan says that his 'list may have a special interest to future students, and also a general interest to botanists, as showing which plants survive a prolonged struggle for existence against grass and sheep.' If the State retains possession of Penikese and establishes a bird sanctuary there, the continued history of the development and succession of plants and animals cannot fail to be of interest and importance. Surveys at stated intervals will give precise information about natural succession under the prevailing climatic and edaphic conditions, and will furnish data on the means of dispersal of species in this region." [1]

A physical feature of little interest to the botanists but offering a relatively important habitat for animals consists in the low stone fences that have been built in somewhat rambling fashion over the hills of the main island. Though now falling down in places, these walls harbor numbers of spiders, isopods and insects. The old houses and sheds are likewise inhabited by many insects and spiders.

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[1] Lewis, I. F., "The Flora of Penikese, Fifty Years After," *Rhodora*, Vol. 26, No. 310, pp. 182–4, October, 1924.

### Earlier Collecting on Penikese.

Although Penikese Island has been visited by naturalists from time to time during the past fifty years, only one paper has been encountered that deals with the fauna above the tide line. It may readily be understood why the pioneers of Agassiz's school had little time for study of the land fauna, engrossed, as they then were, with the revelations of marine life. Yet it seems worth while to quote in full the following communications from members of the original laboratory written fifty years after.

"I do not think that any one at Penikese listed the land snails, insects or other land animals except birds. We were busy with the novelties of the sea. C. O. Whitman gave most of his time to the birds, and I think had a list. F. H. Snow knew birds also. I made no formal list of the fishes, though I began my studies on them there. I could give an approximate record now. I listed also the Algæ, as well as the land plants. Walter Faxon recorded the marine Crustacea, and I made a list of the mollusks. Whether it is in existence now, I do not know. Time works havoc with manuscripts.

"Very sincerely yours,
"David Starr Jordan."

"I do indeed thank you for the pictures of Penikese and the laboratory at Woods Hole. I regret exceedingly that I cannot help you in the matter of Flora and Fauna of that Island. I was too busy with my lecture work to do more than that. The terns' nests with eggs were very abundant and a little work was done on its embryology.

"Faithfully yours,
"Edw. S. Morse."

Information of similar purport has been given me by Professor Cornelia M. Clapp, and Mr. Samuel E. Cassino, others who worked in the old laboratory on Penikese.

It is of particular interest that the only species described from Penikese (of which record has been found) is one of those relatively rare forms of crustacea, the branchiopods, that it should bear the name of the great teacher, and that the description should have been published in the second and final year of the original laboratory. The species is *Eulimnadia agassizii* Packard (1874);[1] it seems never to have been collected elsewhere.

In later years the island has been visited at various times by collectors and specimens have been deposited in several museums; but such collecting was done incidentally or in course of trips to various islands, and, almost invariably, without special publication. An exception is found in the paper by A. P. Morse entitled "Notes on the Orthoptera of Penikese and Cuttyhunk," appearing in *Psyche*, Vol. 7, p. 179, December, 1894.[2]

Among other naturalists who have submitted specimens from Penikese to various museums are J. P. Moore, Manton Copeland, Alexander Forbes, and J. T. Nichols. The following notes are quoted from a letter of Dr. Moore to the editor; "In 1892 and again in 1895, I collected in a small pond on Penikese two species of leeches, *Helobdella stagnalis*, and *Erpobdella punctata*. A few years later I again visited the island and think that I found leeches, but cannot find the record. Leeches are so easily carried by the aquatic birds that introduction is readily accomplished and one may expect to find other species. Even if all of the leeches should be destroyed by a prolonged period of drying of the small pools, the same or other species could be quickly reëstablished. . . . There are probably other species of Oligochæta in addition to the three named in your list. I know that I found *Enchytræus albidus* (= *Halodrilus littoralis*) on the strand and one of the small Naiidæ in fresh water but these records also are not available just at present."

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[1] Packard, A. S. In Sixth Annual Report of the Peabody Academy of Science, Salem, Mass., 54, 1874.

In a later publication Packard says:

"About 100 females, mostly with eggs, occurred in a small pool of fresh water on Penikese Island, Buzzard's Bay, Aug. 27, 1873, collected by Mr. Walter Faxon. Upon examining the pool the following July or August (1874), the young, about a line in length, were found, but the pool subsequently dried up." (Quoted from "A Monograph of the Phyllopod Crustacea of North America, with remarks on the Order Phyllocarida," 12th Annual Report of the U. S. Geological and Geographical Survey of the Territories (for 1878), pages 295–590; Washington, 1883.

[2] I am endebted to Mr. C. W. Johnson for reference to the paper on Orthoptera. The species collected on Penikese are listed in another place. Editor.

## DISCUSSION OF RESULTS.

As will later be shown in detail, animals of 216 species were taken and subsequently identified, and these, grouped by phyla and lesser subdivisions, are distributed as follows:

NUMBER OF SPECIES OF ANIMALS COLLECTED FROM PENIKESE ISLAND, AUGUST, 1923.

| | | |
|---|---|---|
| Annelids | 3 | species |
| Mollusks | 1 | "[1] |
| Arthropods: | | |
| Crustacea | 2 | " |
| Myriapods | 1 | " |
| Insects | 162 | " |
| Arachnids | 15 | " |
| Vertebrates: | | |
| Amphibia | 1 | " |
| Reptiles | 1 | " |
| Birds (actually resting on the island) | 29 | " |
| Mammals | 1 | " |
| Total | 216 | " |

| | |
|---|---|
| Insects by Orders: | |
| Odonata | 3 |
| Orthoptera | 8 |
| Hemiptera (terrestrial 20, aquatic 6) | 26 |
| Neuroptera | 2 |
| Lepidoptera | 13 |
| Diptera | 47 |
| Coleoptera (terrestrial 30, aquatic 24) | 54 |
| Hymenoptera | 9 |
| Total number of species of insects | 162 |

It is worth while to allude to certain groups that are not represented in the list. Although a thorough search was made for fish in the brackish and freshwater ponds, none were found. Since isolation is not usually sufficient to account for the want of small fish in ponds, even such as may occasionally become nearly dry, the absence of such forms is doubtless to be attributed to the abundance of fish-eating birds on the island. It is notable in this connection that the amphibia were represented by a single species, the common toad, the least attractive member of the class to carnivorous animals. Among reptiles, too, turtles and water snakes must be extremely rare, if present at all, the only reptile taken being the common garter snake, of which several specimens were obtained both by the botanists on July 24, and by the zoölogists on August 7. Toads were also taken on both days. It appears that previous collectors interested in the herpetology of the island have found only the toad and the garter snake. It is surprising that aquatic crustacea were not found. Not even were copepods encountered in net collections from the small ponds. Perhaps in this respect, as in others, the results would have been different at another season.

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[1] An aquatic gastropod lost before identification.

Viewing the fauna of the island, as a whole, we observe that it is largely arthropodan—insect, arachnid and myriapod. Exclusive of arthropods and birds, we found but 4 species of invertebrates (3 earthworms and 1 gastropod) and 3 of vertebrates (an amphibian, a reptile, and a mammal). The invertebrate fauna would have been greatly extended by giving consideration to minute forms of animal life; but the vertebrate fauna was doubtless fully covered, except as to birds, which are migratory and seasonal. The apparent relative poverty of the island in nearly all forms of animal life (as regards number of species) may be attributed in great part to the very limited variety of environments, as afforded by plants and physical conditions.

An outstanding feature of the fauna of Penikese Island is its composition (almost entirely) of forms of very general distribution for the latitude. This, of course, is to be expected, since there are no known conditions upon the island to suggest the probability of the occurrence of unusual forms of life. In such a place we must seek not to find a fauna of special types, but rather to ascertain which of the common types of animal life encounter there the conditions favorable or requisite for their existence. Nevertheless, Penikese happens to be the place of collection of at least one specific type. (See p. 23 above.)

It is hoped that, quite apart from any interest which might attach to this survey from its relation to the historical place and occasion, it will serve a useful scientific purpose as a basis of comparison with future conditions. It would be desirable for collections to be made at all seasons, under various weather conditions and in different years. Penikese Island has recently been set aside by the State of Massachusetts as a Bird Sanctuary, and placed under the Board of Conservation who are interested in fostering both the birds and the insect life of the island. The entire aspect of the insect fauna of the island may change materially at any time in consequence either of the invasion of new species adapted to present conditions but not yet arrived, or as a result of changing conditions of vegetation upon the island, such, for example, as would follow upon renewal of grazing or upon natural or artificial reforestation. In event of such change it will fortunately be possible, to some extent, to compare new and old conditions with respect to both plants and animals, and thus to study problems of coördination between the two kingdoms. We have, therefore, thought it a proper function of the introductory part of this report to direct attention to the forms that appear to be lacking, as well as to those that were found. Needless to say, future comparisons must not omit from consideration the season of the year and the precedent meteorological conditions such as are of record elsewhere than in this paper.

## Animals of Land and Ponds,

## Penikese Island, August, 1923.

### ANNELIDS.

(Identification by U. S. National Museum.)

*Lumbricus terrestris* Linnæus.

One adult and one apparently immature example taken near red house.

*Helodrilus calignosus trapezoides* (Savigny).

One example taken at same place.

*Helodrilus tenuis* (Eisen).

Two examples taken with preceding species and one in southern part of island.

## MOLLUSCS.

(Gastropod from pond not identified.)

## ARTHROPODS.

### *Crustacea.*

(Identification by U. S. National Museum.)

*Oniscus asellus* Linnæus.

*Porcellio rathkei* Brandt. Abundant under boards and logs and in stone fences.

### *Myriapods.*

(Identification by R. V. Chamberlain, Museum of Comparative Zoölogy, Cambridge, Mass., through U. S. National Museum.)

*Lithobius forficatus* Linnæus.

### *Insects.*

#### Odonata.[1]

(Identification by C. B. and J. E. Wilson.)

*Anax junius* (Drury). Pond 1–*B*; three nymphs.
Pond 2–*B*; four nymphs.
Pond 1–*D*; seven nymphs.

*Celithemis eponina* (Drury); seen flying about in two places.

*Ischnura verticalis* (Say); Pond 2; two adults.
Pond 2; four adults.

#### Orthoptera.

(Identification by C. E. McClung.)

Gryllidæ.
*Gryllus assimilis.*
*Nemobius vittatus* Harr.

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[1] In reports on aquatic insects (Odonata, Hemiptera, Coleoptera) the several small ponds are distinguished by letters and numbers, as follows: The two small water-holes near the northwest corner of the island are designated 1-*B* and 2-*B*, 1 being southwestward of 2; 1-*C* (Cattail Pond) is on the eastward side of the island near the keeper's house; near the southerly tip of the eastward extension of the island (Tub Point) are two small ponds, 1-*D* and 2-*D*, 1 being northeastward of 2. The largest pond, that near the southerly point of the main island, known to the collectors as South Pond (*A*) was decidedly brackish and yielded only one aquatic insect. The specific gravities (uncorrected for temperature) and the temperatures of the waters of these ponds were as follows: South Pond, 1.015 (20° C.); 1-*B* and 2-*B*, 0.99 (21° C.); 1-*C*, 0.99 (20° C.); 1-*D*, 1.0018 (23° C.); 2-*D*, 1.005 (22° C.).—EDITOR.

Locustidæ.
*Conocephalus fasciatus* De G.
*Orchelimum vulgare* Harr.
Acrididæ.
*Melanoplus femur-rubrum* De G.
*Melanoplus atlanis* Riley.
*Chorthippus maculipennis* Scudd.
*Dissosteira carolina* Linn.

Generally distributed, localized only by distribution of food plants.

The following list of Orthoptera appeared under the title "Notes on the Orthoptera of Penikese and Cuttyhunk," by A. P. Morse. (*Psyche*, Vol. 7, p. 179. Dec. 1894.)[1]

### Species Collected on Penikese.

Acrididæ.
*Stenobothrus æqualis* Scudd. Common.
*Stenobothrus maculipennis* Scudd. Common.
*Chortophaga viridifasciata* De G. Scarce.
*Dissosteira carolina* Linn. Common.
*Psinidia fenestralis* Serv. Scarce.
*Melanoplus atlanis* Riley. Scarce.
Locustidæ.
*Xiphidium* (*Conocephalus*) *fasciatum* De G. Common.
Gryllidæ.
*Nemobius vittatus* Harris. Common.

### Hemiptera (Heteroptera).

(Identification by C. W. Johnson, Boston Society of Natural History.) (See also "Aquatic Hemiptera" below.)

Pentatomidæ.
*Cœnus delius* Say.
Coreidæ.
*Harmostes reflexulus* Say.
Lygæidæ.
*Cymus luridus* Stål.

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[1] Note by courtesy of C. W. Johnson.

Nabidæ.

*Pagasa fusca* Stein.
*Nabis propinquus* Reut.
*Nabis ferus* Linn.

Miridæ.

*Teratocoris discolor* Uhl.
*Pœciloscytus basalis* Reut.
*Lygus pratensis* Linn.
*Onychumenus decolor* Fall.

Saldidæ.

*Saldula interstitialis* Say.

## Hemiptera (Homoptera).

(Identification by C. W. Johnson, Boston Society of Natural History.)

Cercopidæ.

*Philænus leucophthalmus* Linn. var. *ustulatus* Fall.
*Philænus lineatus* Linn.

Cicadellidæ.

*Helochara communis* Fitch.
*Dræculacephala mollipes* Say.
*Dræculacephala minor* Walk.
*Acucephalus albifrons* Linn.
*Deltocephalus simplex* Van D.

Fulgoridæ.

*Liburnia pellucida* Fabr.
*Liburnia campestris* Van D.

## Aquatic Hemiptera.[1]

(Identification by C. B. and J. E. Wilson.)

*Arctocorisa interrupta* (Say); Ponds 1–*D* and 2–*B*; three specimens in all.

*Belostoma flumineum* Say; Pond 1–*B*; one nymph, identification doubtful.

*Corixa verticalis* Fieber: Pond 2–*D*; twenty-two specimens.
Pond 1–*D*; twenty specimens.
Pond 1–*B*; one specimen.
Pond 2–*B*; twenty specimens.
South pond; one specimen.

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[1] See footnote to page 27.

*Buenoa margaritacea* Bueno; Pond 1–*D*; one doubtful nymph.

*Gerris marginatus* Say; Pond 1–*B*; ten specimens; Pond 1–*D*; one nymph.

*Microvelia borealis* Bueno; Pond 2–*B*; one specimen.

### Neuroptera.

(Identification by C. W. Johnson, Boston Society of Natural History.)

Hemerobiidæ.
  *Hemerobius stigmaterus* Fitch.
Chrysopidæ.
  *Chrysopa oculata* Say.

### Lepidoptera—Butterflies.[1]

(Identification by Manton Copeland, Preston S. Copeland and Frederick C. Copeland.)

*Pieris rapae* Linnæus (9).
*Euvanessa antiopa* Linnæus (1).
*Vanessa atalanta* Linnæus (1).
*Vanessa huntera* Fabricius (1).
*Junonia cœnia* Hübner (4).
*Heodes hypophlæas* Boisduval (5).

### Lepidoptera—Moths.

(Identification by C. W. Johnson through Mr. Copeland.)

*Hadena lignicolor* Guenée (1).
*Drasteria erechtea* Cramer (3).
*Drasteria crassiuscula* Haworth (7).
*Pyrausta fissalis* Grote (1).
*Crambus hortuellus* Hübner (18).
*Argyria nivalis* Drury (1).
*Ancylis* Hübner sp? (1).

### Diptera.

(Identification by A. H. Sturtevant, whose report is transmitted with the letter that is quoted immediately following.)

"I am enclosing the list of Penikese Diptera. There are 47 species on it—and these are all that I am able to identify with certainty. I should judge that there are about 30 additional species in the material, including the most conspicuous Dipteran encountered on the island, the mosquito, which apparently belongs in the genus Aedes, but which I have not included because the species remains very uncertain.

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[1] Figures in parentheses denote numbers of examples taken.

"There is one record that seems never to have been published as American, though the insect is so common that I suspect several people must have identified it correctly before—I have myself had the necessary information for two years now. One or two of the other records are of some interest from the point of view of geographical distribution, and that of *Muscina pascuorum* is apparently the only one for 1923 as early as August. Since the species appears to have been introduced from Europe only within the past few years any such data about it are of value, I think."

Asilidæ.
  *Asilus paropus* Walker (Determined by C. W. Johnson).

Dolichopodidæ.
  *Dolichopus albicoxa* Aldrich.
  *D. bifractus* Loew.
  *D. pugil* Loew.
  *D. splendidus* Loew.

Lonchopteridæ.
  *Lonchoptera furcata* Fallen.

Syrphidæ.
  *Allograpta obliqua* Say.
  *Eristalis tenax* Linne.[1]
  *Helophilus lœtus* Loew.
  *Platychirus quadratus* Say.
  *Toxomerus marginatus* Say.

Muscinæ.
  *Muscina pascuorum* Meigen.

Stomoxyinæ.
  *Stomoxys calcitrans* Linne.

Calliphorinæ.
  *Calliphora erythrocephala* Meigen.

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[1] Larvæ of this, or a very similar species were very common in samples of mud taken from the bottom of freshwater ponds.—R. E. C.

*Lucilia cæsar* Linne.
*Lucilia sylvarum* Meigen.
*Pollenia rudis* Fabricius.

Ortalinæ.
*Chætopsis fulvifrons* Macquart.
*C. massyla* Walker. These two species were taken in large numbers in the salt marshes, but no specimens were obtained of *C. ænea* Wiedemann and *C. apicalis* Johnson, which are the common salt marsh species of the mainland and of Naushon.

Trypaneinæ.
*Euaresta bella* Loew.
*Trypanea abstersa* Loew.
*T. daphne* Wiedemann.

Agromyzinæ.
*Cerodonta dorsalis* Loew.

Sepsinæ.
*Sepsis violacea* Meigen.
*Themira minor* Haliday.

Ochthiphilinæ.
*Ochthiphila polystigma* Meigen.

Chloropinæ.
*Botanobia coxendix* Fitch.
*B. frit pusilla* Meigen.
*Chloropisca glabra* Meigen.
*Elachiptera costata* Loew.
*Melanochæta longula* Loew.

Drosophilinæ.
*Drosophila quinaria* Loew.
*Scaptomyza adusta* Loew.

Ephydrinæ.
*Dichaeta caudata* Fallen.
*Dimecœnia spinosa* Loew.
*Ephydra subopaca* Loew.
*Notiphila scalaris* Loew.
*Ochthera mantis* DeGeer.
*Pelina truncatula* Loew.

*Psilopa atrimana* Coquillett.
*P. flavida* Coquillett.
*Scatella dichæta* Loew.

Borborinæ.

*Leptocera atra* Adams. Common and widespread.

*Leptocera brachystoma* Stenhammar. This species does not seem to have been recorded as American. It is common under eel-grass at high tide level at least throughout the Woods Hole region. I have compared my specimens with British material determined by J. E. Collin, Esq.

*Leptocera lutosa* Stenhammar. Common and widespread.

*Borborus geniculatus* Macquart.

Phycodrominæ.

*Cœlopa parvula* Haliday.

## Coleoptera.

(Identification by C. W. Johnson, Boston Society of Natural History.)

Carabidæ.

*Galerita janus* Fabr.
*Chlænius pennsylvanicus* Say.
*Harpalus caliginosus* Fabr.
*Harpalus compar* Lec.
*Harpalus pennsylvanicus* DeGeer.
*Harpalus herbivagus* Say.

Staphylinidæ.

*Ocypus ater* Grav.

Silphidæ.

*Necrophorus americanus* Oliv.
*Necrophorus marginatus* Fabr.
*Silpha lapponica* Hbst.

Histeridæ.

*Saprinus* sp.

Cantharidæ.

*Silis bidentatus* Say.

Mordellidæ.

*Mordellistena pustulata* Melsh.

Elateridæ.
  *Melanotus fissilis* Say.
    Also a number of larvæ.
  *Melanotus communis* Gyllenhall (Identified by U. S. National Museum).

Dermestidæ.
  *Dermestes vulpinus* Fabr.

Nitidulidæ.
  *Conotelus obscurus* Er.

Phalacridæ.
  *Stilbus apicalis* Melsh.

Coccinellidæ.
  *Hippodamia parenthesis* Say.
  *Coccinella novemnotata* Hbst.

Tenebrionidæ.
  *Blapstinus mæstus* Melsh.
  *Tenebrio obscurus* Fabr.

Scarabæidæ.
  *Aphodius fimetarius* Linn.
  *Xyloryctes satyrus* Fabr.
  *Phyllophaga?* sp.? (larvæ).

Chrysomellidæ.
  *Calligrapha elegans* Oliv.
  *Galerucella notata* Fabr.
  *Diabrotica duodecimpunctata* Fabr.
  *Phyllotreta sinuata* Steph.

Curculionidæ.
  *Brachyshynchus ovatus* Linn.

### Aquatic Coleoptera.[1]

(Identification by C. B. and J. E. Wilson.)

*Acilius semisulcatus* (Aubé); Pond 1–*D*; two specimens.
*Agabus disintegratus* Crotch; Pond 1–*B*; three specimens.
*Berosus striatus* (Say); Pond 1–*B*; two specimens.
*Cœlambus impressopunctatus* (Schall.); Pond 1–*D*; nine specimens.

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[1] See footnote to p. 27.

*Cœlambus inæqualis* Fabricius; Pond 1–*B*; six specimens.
*Deronectes depressus* Fabricius; Pond 1–*B*; ten specimens.
*Dytiscus fasciventris* Say; Pond 1–*C*; two specimens.
*Hydrophilus obtusatus* (Say); Pond 1–*B*; one specimen.
*Haliplus ruficollis* DeGeer; Pond 2–*B*; eighteen specimens.
*Hydroporus americanus* Aubé; Pond 1–*B*; three specimens.
*Hydroporus modestus* Aubé; Pond 2–*B*; twelve specimens.
*Hydroporus niger* Say; Pond 1–*B*; fourteen specimens.
*Hydroporus proximus* Aubé; Pond 1–*B*; two specimens.
*Hydroporus stagnalis* G. & H.; Pond 1–*B*; seventeen specimens.
*Hydroporus tenebrosus* Lecepède; Pond 1–*B*; one specimen.
*Hydroporus undulatus* Say; Pond 1–*B*; twenty specimens.
*Octhebius foveicollis* Lecepède; Pond 2–*D*; two specimens.
*Philhydrus cinctus* Say; Pond 2–*D*; fifty specimens.
*Philhydrus nebulosus* Say; Pond 1–*D*; one specimen.
*Rhantus binotatus* Harris; Pond 1–*D*; two specimens.
*Rhantus bistriatus* Bergst.; Pond 1–*B*; one specimen.
*Thermonectes basilaris* Harris; Pond 1–*D*; two specimens.
*Tropisternus glaber* Herbst; Pond 2–*B*; six specimens.
*Tropisternus nimbatus* Say; Pond 1–*C*; one specimen.

### Hymenoptera.

(Identification by C. W. Johnson, Boston Society of Natural History.)

Ichneumonidæ.
  *Therion morio* Fabr.

Formididæ.[1]
  *Myrmica scabrinodis* Nyl. subsp. *schencki* Emery var. *emeryana* Forel.
  *Lasius niger* Linn. var. *americanus* Emery.
  *Lasius* (*Chthonolasius*) *brevicornis* Emery.

Halictidæ.
  *Halictus provancheri* Cress?

Megachilidæ.
  *Osmia lignaria* Say.

Apidæ.
  *Bombus fervidus* Fabr.

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[1] Identified for the Boston Society of Natural History by Dr. W. M. Wheeler.

*Bombus americanorum* Fabr.
*Bombus bimaculatus* Cress.

### Arachnids.

(Identification by J. H. Emerton, through U. S. National Museum.)

*Enoplognatha marmorata* Hentz.
*Epeira trivittata* Keys. Many specimens.
*Epeira pratensis* Hentz. Immature.
*Epeira stellata* Hentz. Immature.
*Argiope trifaciata* Forskal. Young, several specimens.
*Tetragnatha laboriosa* Hentz.
*Agalena naevia* Walck. All young, half grown.
*Dolomedes sexpunctatus* Hentz. Young.
*Lycosa helluo* Walck. With egg cocoon.
*Pardosa nigripalpis* Em.
*Pardosa glacialis* Th.
*Pardosa lapidicina* Em.
*Zelotes ater* Hentz. Adult male and young.
*Ariadne bicolor* Hentz.
*Phidippus multiformis* Em.
*Xysticus gulosus* Keys.[1]

### Birds.

Observed and identified by Ondess L. Inman and Everett C. Myers. (With confirmatory observations by others.)

Song Sparrow—*Melospiza melodia melodia.* Most common land bird.
Chipping Sparrow—*Spizella passerina passerina.* Few.
Seaside Sparrow—*Passerherbulus maritimus maritimus.* Common.
Sharp tailed Sparrow—*Passerherbulus caudacutus.*
English Sparrow—*Passer domesticus.* Fairly common about buildings.
Field Sparrow—*Spizella pusilla pusilla.* Few.
Vesper Sparrow—*Poocœtes gramineus gramineus.*
Common Tern—*Sterna hirundo.* Most common.

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[1] Specimens identified by J. H. Emerton through Boston Society of Natural History.

Roseate Tern—*Sterna dougallii.* Fairly common.
Least Tern—*Sterna antillarum.* Rare.
Cory Shearwater—*Puffinus borealis.* Rare.
Herring Gull—*Larus argentatus.* Rare.
Laughing Gull—*Larus atricilla.* Rare.
Meadow Lark—*Sturnella magna.* Few (6).
Yellow Warbler—*Dendroica æstiva æstiva.* One pair.
Upland Plover—*Bartramia longicanda.*
Semipalmate Sandpiper—*Ereunetes pusillus.* Very common.
Little Green Heron—*Butorides virescens.*
Ruddy Turnstone—*Arenaria interpres morinella.* Two.
Red-wing Blackbird—*Agelaius phœniceus.* Common.
Spotted Sandpiper—*Actitis macularia.*
Least Sandpiper—*Pisobia minutilla.*
Killdeer—*Oxyechus vociferus.*
Yellow legs—*Totanus* sp.? Rare.
Woodcock—*Philohela minor.*[1] One.
Virginia Rail—*Rallus virginianus.*
Curlew—*Numenius* sp.?
Eve Swallow?—
Ringneck Plover—*Aegialitis semipalmata* (Semipalmate Plover).

### Other Vertebrates.

*Bujo jowleri*—Common toad. 4 examples.
(Identified by Miss Doris M. Cochran, U. S. National Museum.)
*Thamnophis sirtalis sirtalis*—Common garter snake. 6 examples.
(Identified by Miss Doris M. Cochran, U. S. National Museum.)
*Peromyscus leucopus noveboracensis* (Fischer). Field mouse. One example taken in one of the traps left on the island. Specimen preserved by the kindness of the State caretaker on Penikese; identified by F. E. Wood.

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[1] Reported by D. B. Young.

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